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Facebook Influence among Incoming College Freshmen: Sticky Cues and Alcohol

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Abstract

Alcohol displays on Facebook are ever-present and can be socially desirable for college students. As problematic drinking is a concern for college students, this research sought to understand how different types of information on a Facebook page influence likelihood to drink. Telephone interviews were conducted with 338 incoming college freshmen from two large national universities. Data were obtained from a vignette prompt which presented a scenario in which a senior college student's Facebook profile displayed wall-posts, pictures, and status updates that were drinking-related or pro-social in nature. Participants were asked to report intention to drink alcohol with that student if together at a party. Findings supported the hypotheses: wall-posts were most influential (the stickiest), followed by pictures, followed by status updates. Findings provide additional empirical support for established online impression formation patterns, and additionally provide evidence that virtual cues are being ingrained as schema in interpersonal communication. These results are discussed in relation to the conception of "sticky cues" in impression formation.

The way that individuals meet is fundamentally changing. While the forming of an acquaintance and initiation of a relationship was once characterized by a process of gradual disclosure (Altman & Taylor, 1973), today it is possible to rapidly access an avalanche of information about acquaintances. Whether this occurs as online daters Google each other for additional information (Gibbs, Ellison, & Lai, 2011) or as adolescents explore a new friend's social network postings (Courtois, All, & Vanwynsberghe, 2010), personal information is readily available. After a few clicks on the computer, one can form impressions of an individual based off of everything from their vacation pictures to what others say to them on their social networking profile.

One population for whom online impressions likely play a significant role in the friendship formation process is that of college students. Among college students, the use of online social networking sties (SNSs) has become ubiquitous with up to 99.5% of students

reporting use of Facebook (Alemán & Wartman, 2011). However, there are growing concerns about exactly what these individuals display to peers on personal profile pages.

Specifically, college students frequently display references to alcohol use on SNSs (Moreno, Parks, Zimmerman, Brito, & Christakis, 2009), a phenomenon that likely emerges during the first year of college (Moreno et al., 2014). This is concerning for overconsumption is normative for the college population (Hingson, Zha, & Weitzman, 2009), alcohol use is associated with risky behaviors (Cooper, 2008), and these peer-generated displays can influence younger students' attitudes and intentions towards alcohol (Litt & Stock, 2011; Moreno, Briner, Williams, Walker & Christakis, 2009).

Purpose

Given the growing intersection among Facebook, friendship formation, and collegiate drinking, this research seeks to address the influence that different types of information on a new friend's Facebook profile may have on first year college student likelihood to drink. Further, this research addresses whether the importance of a piece of information on Facebook carries weight even when presented without the visual stimuli of a computer screen and familiar context.

Online Impression Formation & Sticky Cues

This notion, that some information is weighted differently than other information, is not necessarily new. A number of fields have long considered what information matters in judging another. From warmth and competence (Fiske, Cuddy, & Glick, 2007), to beauty (Eagly, Ashmore, Makhijani, & Long, 1991), to negativity and extremity (Skowronski & Carlston, 1989), scholars have long been interested the basic idea of meaningful cues. This particular research seeks to advance this tradition in its newest iteration: impression formation online.

One understanding for how judgments arise from online impressions comes from social information processing theory (SIPT) (Walther, 1992). The SIPT framework suggests that when forming an impression of another via an online profile, the perceiver utilizes all the available information, whether it is in the form of pictures or text, and each bit of information is referred to as a cue. Moreover, some cues matter more than others. Cues that are "especially informative about a message source's credibility" have been deemed "sticky cues" (Van Der Heide & Schumaker, 2013), for they grab the attention of a perceiver in the impression formation process and influence judgment more so than other cues.

Previous research has already indicated the presence cues that might be deemed "sticky" in online profiles. First, research has supported visual primacy in online impressions (Van Der Heid et al., 2012). When photographic and textual self-disclosures are presented together on a Facebook profile, photographs more strongly influenced social orientation judgments. Photographs are seen as more credible, and weighed heavier in impression formation.

In applying patterns of visual primacy and online impression formation to a population of incoming college students there are some distinct predictions possible. We hypothesize that

when a college freshman is considering whether to drink with a new friend, the new friend's Facebook photos will receive stronger consideration, and more extreme responses, than any textual self-disclosures.

H1: For incoming college students, considering pictures on a new friend's Facebook profile will lead to more extreme responses on likelihood to drink intentions, whether positive or negative, compared to status updates.

Another form of information that may represent a sticky cue is a wall post. A wall-post is a textual statement written by another individual that appears on one's own profile page. Research has supported the warranting theory online (Walther et al., 2009; Van Der Heide, Johnson, & Vang, 2013), which predicts that other-generated cues have a greater impression weight than user-generated cues. It follows that a wall-post on Facebook would carry greater value than a personal picture. This occurs as a photo angle can be selectively chosen and posted oneself, whereas it might take more effort to convince friends to complement one's appearance on a Facebook wall.

Applying warranting theory to a context of first year collegiate students is again insightful. If a first year student were judging a new friend, and considering how to act with that new friend based on viewing their Facebook profile, it is likely that the strongest judgments would arise from reactions to what that individual has contained on their wall – the clearest other-generated cue. Thus, a second hypothesis can be posited:

H2: For incoming college students, wall-posts on a new friend's Facebook profile will produce more extreme responses on likelihood to drink intentions, whether positive or negative, compared to pictures.

Positive and Negative Cues

Finally, research has indicated that the online context in which personality information is presented can affect how it is interpreted (D'Angelo & Van Der Heide, 2013). Specifically, D'Angelo and Van Der Heide (2013) identified positivity and negativity effects, (driven by the nonnormativity effect), which can arise in impression formation. Simply put, cues that are not expected in a given online context will be judged in respect to their valence in that online context.

The positivity and negativity effect allow for certain predictions about personality judgments in an online environment (D'Angelo & Van Der Heide, 2013; Carr & Walther, 2014). For example, it is likely that individuals about to begin their freshman year of college will not have been exposed to many drinking references from same-age friends on Facebook, as alcohol references tend to emerge *during* the first year of college (Moreno et al., 2014). Additionally, older adolescents today know the public nature of anything they post online (Lewis, Kaufman & Christakis, 2008), and such postings are taboo among this population for whom drinking is illegal. Thus, any postings of reference to drinking would likely be frowned upon, coming off as negative. While the negativity effect may emerge from drinking references, there is also the possibility of a positivity effect emerging from pro-social messages. Here, pro-social is defined as any type of cue that indicates a desire to better one's self or others. For example, discussion of a study group may occur on an

individual's wall, and seeing such uncommon pro-social cues on a new friend's Facebook profile may produce a positive judgment of that individual's character.

Predictions of these positive and negative responses are strengthened when considering processes of adolescent development. Specifically, there is a well-documented concept associated with adolescent development: resiliency (see Luthar, Cicchetti, & Becker, 2000 for review). Resilience has been deemed an ordinary phenomenon whereby adolescents, even when faced with threats, will achieve positive outcomes (Masten, 2001).

Combining what is known about negativity and positivity effects, with the notion of resilience, certain predictions can be made. Given that drinking itself is a rather normative behavior on many college campuses (Weschler, Lee, Juo, & Lee, 2000) and expected aspect of college, it is likely that even underage students will participate. However, at the same time, the notion of resilience suggests that these individuals would be more likely to place themselves in a safe situation with a responsible individual to partake in alcohol, than with an individual who they may deem as irresponsible, unsafe, or unintelligent. Thus, the following hypothesis can be stated:

H3: For incoming college students, pro-social Facebook cues on a new friend's profile will lead to higher likelihood to drink intentions compared to drinking related Facebook cues.

Internalizing Social Networks: Cues as Schema

Understanding how individuals' view and form impressions of online profiles is an important task. However, online profiles are no longer just online – they are often discussed in person, over a conversational audio channel. SIPT (Walther, 1992), the theory upon which the notion of sticky cues and the nonnormativity effect are built, is a theory about visual processing. However, Facebook, wall-posts, and status updates are common conversational topics for collegiate students and others. (“Did you see what he posted on her wall?!”) Thus, the final aspect of this research attends to the movement of cues away from being simply screen-based structures.

Importantly, in verbal conversation these structures of online communication lack the visual aspects that allow a perceiver to clearly judge wall-posts as other-generated and perhaps more credible than pictures or textual self-statements. However, it is possible that certain features of online communication have become ingrained in communicators to the degree that they are automatically interpreted as being more or less important, regardless of visual cues. If this is the case, it is possible that credibility of certain cues are so familiar to college aged students that they may be considered schema: a personal mental framework that allows individuals to process information in an effective and automatic manner (Anderson, 1990). A schema is generally believed to have some level of activation, which also triggers other related schema, thus acting as a cognitive shortcut, similar to a heuristic. If wall-posts and pictures are schema, the associated heuristic might be a signal of credibility or importance for judging an individual. Hence, this research aims to test the stickiness of cues through an auditory channel, thus entertaining the notion of Facebook cues as schema.

Method

Participants

This study took place at two large public universities, one Western and one located in the Midwest. Students were randomly selected from the registrar's lists of incoming freshmen students from both universities and deemed eligible if they were between the ages of 18 and 19 years and enrolled as full time freshmen for fall 2011 at one of these two universities. This sample focused on incoming freshman for two reasons. First, this research represents the first stages of a longitudinal study involving these students. Second, the measures taken at this time (prior to freshman year) were deemed an important line of investigation given the likely position of Facebook in the friendship formation and uncertainty reduction processes during the first year of college. A total of 338 participants were interviewed, 190 (56%) of whom were Female and 148 (44%) of whom were male, with 198 (58%) from the Midwestern University and 139 (41%) from the Western University. Of these participants 252 (75%) identified as Caucasian, 39 (12%) as Asian, 21 (6%) as more than one ethnicity, 13 (4%) as Hispanic, and 5 (1%) as African American.

Given that the aim of this study involved predicting likelihood to drink, nondrinkers were screened out of analyses. There were a total of 50 non-drinkers removed from this sample, leaving 288 total participants considered in the analyses.

Interviews

After providing consent, all participants completed a phone interview. Interviews were conducted by trained research assistants and lasted between 40 and 60 minutes on average. During interviews data were recorded onto a collection spreadsheet. Interviews included a vignette.

Vignette

To assess the influence of Facebook cues on intention to use alcohol a vignette was utilized. Vignettes, systematically elaborated descriptions of concrete situations, are a valid and comprehensive method for assessing exploring people's perceptions, beliefs and meanings about specific situations (Alexander & Becker, 1978; Barter & Renold, 1999; Dresselhaus, Peabody, Luck, & Bertenthal, 2004; Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000; Peabody, Luck, Glassman, Hanaen, Spell, & Lee, 2004; Young, Dilworth, & Mott, 2011). Vignettes allow for the manipulation of important study variables in a manner that would not be feasible in an observational study, as well as the collection of information from a large number of participants simultaneously. Further, vignettes allow for avoidance of observer effect and ethical dilemmas, and the control of confounding effects (Dresselhaus et al., 2004; Gould, 1996; Peabody et al., 2000; Spalding & Phillips, 2007).

The vignette was designed to assess participant views of how displayed Facebook content would impact their intention to drink in a particular setting. To develop alcohol references, past databases of coded Facebook information were reviewed and example references to alcohol use were noted. To develop non-alcohol related posts, active Facebook profiles were reviewed to identify references that were non-alcohol related. For the purposes of

consistency within this study, these prompts were intended to have a pro-social tone. These vignettes were then tested on a pilot sample of participants and edited in response to comments.

These vignettes presented a scenario in which the participant (who was to enter college within three months of the interview date) was invited to a party by a senior student that they just met. The student was then asked to imagine that they were currently looking at the senior student's Facebook profile, prior to going out to that party tonight. Then, the participants were presented with a number of different cues that they might see on this individual's profile, and asked to respond with their likelihood to drink with this individual at the party after viewing each cue. Cues varied in type (wall-post, status update, picture) and valence (pro-social vs drinking-related) with dummy prompts of interests and groups also included. See Appendix A for full vignette prompt.

Results

Taken together, the Hypotheses 1 through 3 predict a distinct pattern of means. Specifically, when assessed with response on likelihood to drink, the cue pattern was predicted to move from least likelihood to greatest likelihood as follows: drinking-related wall post, drinking-related picture, drinking-status update, pro-social status update, pro-social picture, pro-social wall post. In order to assess the predicted pattern of differences, a repeated measures ANOVA was conducted and the data was tested for a linear trend, while controlling for gender, ethnicity, and university. As predicted, there was a significant effect of cue type on likelihood to drink, $F(5, 1390) = 5.915, p < .01$, Partial $\eta^2 = .02$. Additionally, there was a significant linear trend $F(1, 278) = 7.79, p < .01$, Partial $\eta^2 = .03$, indicating that likelihood to drink in response to cues increased proportionately, as predicted by Hypotheses 1 through 3. However, while the hypotheses received statistical support, the effect sizes were rather small. Figure 1 illustrates the pattern of means.

As is evident, the pattern of means falls in the manner that was predicted by the hypotheses. Specifically, Hypothesis 1 (visual primacy) was supported with pictures receiving more extreme ratings than status updates, and Hypothesis 2 (warranting) was supported with the wall-posts receiving the most extreme ratings. Additionally, pro-social cues lead to an overall higher likelihood of drinking, with drinking cues leading to a lower likelihood of drinking, thus supporting Hypothesis 3 (positivity and negativity effects, resilience).

Given these results, specific differences among cue types were tested. In order to test these predictions, first score differences were computed. This was done to assess the strength of response to particular cue types. For example, wall-posts with drinking related references lead to the least likely intention to drink ($M = 1.65$), whereas wall-posts with pro-social references lead to the highest intention ($M = 2.60$), leaving wall posts with the greatest computed difference ($M = .95$). Thus, wall-posts led to the most extreme reactions, compared to the range of reactions from pictures, and status updates. Using these difference scores, Bonferroni corrected paired t-tests were conducted, as suggested by Field (2009), to compare levels of difference scores as the independent variable. As predicted, likelihood changes based on pictures were more extreme than the difference between status updates,

and likelihood changes based on wall posts were more extreme than the difference between pictures, thus supporting H1 and H2 respectively. See Table 1 for means and *t*-test results.

Discussion

While college students readily consume both Facebook (Alemán & Wartman, 2011) and alcohol (Weschler et al., 2000), little is known about how one activity may affect the other, how the impression formation process impacts intended behavior. Moreover, the impact of this process may be taking place both through visual channels when individuals interact with computer screens, and through auditory channels as discussion of Facebook is becoming as staple of face-to-face conversation. Thus, this research presented a vignette to examine how cues presented on Facebook, which were either alcohol-related or pro-social, impacted college students' self-reported intentions to drink alcohol. Findings indicated that some cues do matter more; some cues were stickier than others. Additionally, findings indicated that viewing pro-social cues led to a higher self-reported likelihood to drink with a target individual for first year college students. Finally, this research found that these predicted patterns emerge when being tested over an auditory channel, suggesting that sticky cues are not only an element of visual perception and impression formation, but rather are making their way into the very schema of interpersonal communication.

With such findings, this research provides further empirical evidence of visual primacy (Van Der Heide et al., 2012), and the warranting effect (Walther et al., 2009), in the impression formation process. However, it does so by enhancing the conceptualization of "sticky cues" (Van Der Heide & Schumaker, 2013). According to these findings, wall-posts are the stickiest cues associated with Facebook page, followed by photographs, followed by textual self-disclosures.

The second contribution of this research comes in the more practical findings concerning the interaction of Facebook and collegiate drinking. We found that pro-social cues were associated with increased reported intention to drink compared to alcohol-related cues. This pattern may be predicted by the negativity and positivity effect (D'Angelo & Van Der Heide, 2013) associated with online impression formation, as drinking related references are likely seen as negative for this population which is likely aware of online privacy and legality issues (Ellison, Vitak, Steinfield, Gray, & Lampe, 2011). Additionally, the resiliency framework (Luthar, 2000) for adolescent development suggests that older adolescents will not knowingly put themselves into a harmful situation, rather seeking a responsible route if given the time and right decision making context, suggesting a pro-social post might be judged as positive for the context of Facebook, and acted on as such.

Finally, this research takes a theoretical leap in consideration of the importance of cues online. Many processes identified in CMC find their foundation in communication processes established first in face-to-face communication: the non-normativity effect (D'Angelo & Van Der Heide, 2013) was drawn from correspondence inference theory (Jones & Davis, 1965), and visual primacy (Van Der Heide et al., 2012) emerges from work evaluating visual and verbal cues (Argyle, Alkema, & Gilmour, 1972; Mehrabian & Wiener, 1967). Patterns emerged in face to face communicative action, and were found to exist in computer-

mediated communication as well. Now, in this study we see that this may hold true in the opposite direction. The findings from this study support impression formation predictions that do not end when the phone or computer are turned off. Cues that are important online may be internalized and have impact even when no screen is present. A wall-post may have started as an impression formation based cue, but its importance is even clear when discussed via face-to-face communication. Thus, this research both indicates which cues are stickiest in impression formation, and supports that sticky cues exist not only on the webpage, but rather as learned schema within the mind.

Limitations and Future Directions

This study has limitations which must be considered. First, the vignette methodology, though informative as a step forward in research, has a number of incorporated considerations. A possible source of error includes the fact that each participant was exposed to a single questionnaire with all cues. While the cues were not presented in the order of means hypothesized, it is possible that there were order effects. Further, there was no control variable assessed within this vignette. While it is clear pro-social cues lead to a higher likelihood to drink than drinking related cues, it is unknown how these cues relate to baseline intentions. Thus, future research should seek to establish these effects in a randomized experiment between subjects, and also assess how these cues relate to baseline drinking likelihoods. Additionally, this vignette did not specify the gender of the senior college student. It is possible that individuals might have interpreted this senior student as same-sex or opposite sex, and responded to the prompt differently because of this assumption. Future research should explore the impact of gender in association with college alcohol use and influence on Facebook.

A second limitation comes in the population sample. The sample was taken specifically of incoming freshman students from two universities; the gender and demographic characteristics of the sample are consistent with those of the larger universities, suggesting the population was generalizable to larger schools. However, the generalizability of the results cannot extend beyond this population. Thus, future research should examine different types of school settings, and whether these patterns of cue influence extend over time, especially in a manner that addresses the evolving norms of social and networked life that a college student can experience. Additionally, it is questionable whether these patterns exist in populations with different drinking and posting norms.

A third limitation comes in the consideration of the evidence for warranting theory over visual primacy. While this finding has theoretical and empirical support within this paper, a stronger manipulation would involve an actual simulation administered via screen. This would allow the hypothesized mechanisms behind these theories to occur naturally. Thus, further research is needed before this particular hierarchy can be established with strong evidence.

A fourth limitation arises from the consideration of alcohol consumption likelihoods. Our study did not assess intended or actual drinking frequency or quantity. Future research on Facebook cue influence in this domain should consider both participant drinking behaviors

and participant drinking intentions in a more specific manner. While it is clear future work is necessary to further understand the influence of Facebook cues on collegiate alcohol consumption, the findings of this research represent a strong first step to understanding the visceral impact of a virtual environment.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Drinking Likelihood Estimated Marginal Means in Response to Specific Facebook Cues

Table 1Mean difference *t*-tests

	Cues		df	<i>t</i>	<i>p</i>
Hypothesis 1	Pictures <i>M</i> = .70, <i>SD</i> = 1.35	Status-updates <i>M</i> = .47, <i>SD</i> = 1.49	283	3.03	<.01
Hypothesis 2	Wall-posts <i>M</i> = .95, <i>SD</i> = 1.49	Pictures <i>M</i> = .70, <i>SD</i> = 1.35	285	3.37	<.01

Note. A Bonferroni correction has been applied for multiple comparisons